REMARKS

Claims 1-11, 13- 21 were pending.
Claims 11, 14-17 and 21 are withdrawn.
Claim 22 is new.
Claim 1 is amended.
Claim 10 is cancelled.
Claims 1-10, 13 and 18-20 are rejected.
Claims 1-9, 11 and 13-22 are now pending.

New claim 22

The process according to claim 1, wherein the flocculant is formed from ethylenically unsaturated water soluble monomers selected from the group consisting of (meth) acrylic acid or salts thereof and acrylamide and the flocculant exhibits an intrinsic viscosity in the range of 7 to 25 dl/g.
Support is found on page 8, second paragraph.

Claim 1 is amended to include the limitations of claim 10 and to delete the embodiment using only a charged microparticulate.

No new matter is added.

35 USC 103(a)

Claims 1-10, 13 and 18-20 are rejected under 35 USC 103(a) as being unpatentable over Brink, US 4,384,897 in view of Brelsford, US 5,411,594 and Kuo, US 5,529,699.

Examiner believes applicants have not provided any evidence that the claimed combination of flocculation and mechanical separation provides any unexpected result, particularly not commensurate in scope with the claims.

Examiner is incorrect in this respect. Applicants direct examiner to the examples II, III and IV.

The examples clearly show that the combination of flocculant with mechanical separation give several unexpected advantages:

- Increase in Speed of Separation
- More effective Removal of Acid and Sugar from Hydrolysate

Increase in Speed of Separation

Example II

The speed at which liquid separates from the solids in the sample after hydrolysis can be measured using the rig shown in Figures 4 and 5. The rig measures the time taken for liquid to spread across the filter paper from contact 34 to 38. This is known as Capillary suction Time (CST) and is a measure of the speed of separation of liquid from solids in the test sample. See page 15, line 21 to bottom of the page through page 16, lines 1-14. In particular please note the table on page 16.

Approximately a 28 % speed of separation improvement is seen when using Polymer 1 (acrylamide hompolymer with an IV of approx. 15 dl/g) in contrast to filtration without flocculant.

More effective Removal of Acid and Sugar from Hydrolysate

Example III

The equipment with reference to Figures 6 and 7 is used to examine the separation of acid and sugar from a sample of hydrolysate treated in accordance with the invention. As can be seen the inclusion of a flocculant causes a rapid increase in the cumulative conductance on the addition of the wash water which indicates that acid is being effectively removed with the wash water. In particular, please note Figure 8 and the rapid increase in conductance of the wash water for 200 ppm Polymer 1 cumulative conductance.

Further Figure 9 shows the cumulative amount of sugar determined in the filtrate following the addition of wash water. Note the rapid rise in Figure 9 of the cumulative sugar concentration when 200 ppm of Polymer 1 flocculant is used in contrast to the control (no use of polymer flocculant).

Example IV

Following the same procedure as in Example II the actual amount of sugar recovered in the wash water is evaluated with two different polymer (polymer 1 as above and polymer 2 which is a copolymer of 8% sodium acrylate and 92% acrylamide of IV 9dl/g) at two different polymer concentrations.

The last table on page 18 shows that both polymers give improved sugar recovery when used at 200 ppm dosage levels when compared to the control. Further polymer 2 gives improved performance when used at 600 ppm levels.

By using the special flocculation process in the separation stage, less sugar remains in the first hydrolysis step with the harder to hydrolyse material such as cellulose. It is believed that even small quantities of C5 sugar in the harder to hydrolyse material, under the more drastic hydrolysis conditions of the second stage will results in trace amounts of these sugars being converted into furfural and possibly other aldehydes which may poison microorganisms or enzymatic biocatalysts used in the fermentation process.

Thus the present method as claimed using the action of the flocculating agent greatly enhances the separation of the solids from the liquor. For example improvements which could not have been predicted based on the references cited are increased sugar recovery from hydrolysate; increased speed of separation of solid from liquid and more effective removal of acid from hydrolysate.

Furthermore, the examiner has used a number of references to make his case. He has used Brinks to provide the essential claim steps. However, Brinks clearly does not teach separation of acidic suspensions.

Nor does Brinks suggest flocculants as presently claimed. Thus examiner has looked to Brelsford which teaches the separation of acidic suspensions of hydrolyzed particulate plant derived material and to Kuo which teaches the use of flocculants as aids in pulp and papermaking systems.

The problem with these arguments and combinations of references:

Brelsford teaches that the separation stages in which the solid residue and aqueous sugar aqueous sugar residue are separated may be done while the mixture is acidic (col. 3, lines 10-27).

However, Brinks teaches separation only under neutralization conditions. The examiner believes that since Brelsford teaches that it is desirable to conduct a separation stage without neutralizing the solution, that it would be obvious to adapt the separation steps of Brinks as taught in Brelsford.

However, as discussed in a previous reply (Dec. 11, 2008, page 7, first paragraph), the particular flocculants taught by Brinks would not work in an acidic environment. Separation can only occur in Brinks in the neutralization unit using Brink's proposed flocculants. Thus it is unclear why one reading Brinks would adapt his process and carry out separation in an acidic environment. Simply because it is known to carry out a separation step in an acidic environment is not exactly a suggestion, motivation or teaching to adapt another process where separation specifically is advised in an alkaline environment, indeed would not work in an acidic environment.

Further, the examiner has taken the flocculants taught in Kuo, also appropriately used under alkaline conditions. Examiner's rational for using Kuo is Kuo teaches that the charged polymers are desirable for use as flocculants because their charge is pH-independent and would be desirable in the method taught by Brink because the Brink method is conducted under acidic conditions. Although, the hydrolysis steps are carried out under acidic conditions in Brinks the separation steps are not for good reasons.

Thus this is the examiner's rational for taking a flocculant such as those taught in Kuo, not remotely suggested in either Brinks or Brelsford and applying to the separation steps in Brinks but then changing the separation steps of Brinks to conform to an acidic environment of Brelsford when Brinks flocculants would not work in an acidic environment seems contrived.

Additionally Kuo et al. discloses cationic copolymer which always include an N-vinylamide monomer. Thus the polymers presently claimed are not encompassed by Kuo as the monomer N-vinylamide is clearly excluded. The additional references do not make up for the limitations of Kuo. The rejection is therefore incomplete not meeting all the limitations of the present claims.

For the reasons given above, applicants respectfully request reconsideration of the rejections.

Double Patenting

Claims 1-3, 5, 8-10 and 13 and 18-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 5, 7, 8,10 and 11 of copending Application NO. 10/523,229 in view of Brink.

Claims 1-10, 13, and 18-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4, 5, 7,8, 10 and 11 of copending Application No. 10/523,229 in view of Brink and further in view of Brelsford.

Applicants wish to postpone submitting terminal disclaimers until after the 103(a) rejection has been resolved. At that point, applicants will better know the final state of the claims and can address the appropriateness of the provisional double patenting rejections.

Reconsideration and withdrawal of the rejection of claims 1-10, 13 and 18-20 is respectfully solicited in light of the remarks and amendments *supra*.

Since there are no other grounds of objection or rejection, passage of this application to issue with claims 1-10, 13 and 18-20 is earnestly solicited.

Applicants submit that the present application is in condition for allowance. In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

Respectfully submitted,

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Enclosure: Request for Continued Examination.